

REMARKS

This is in response to the Office Action mailed December 15, 2006. In response to the Examiner's Detailed Action, by this amendment, claims 1-26 remain in this application.

Claim Rejections – 35 USC § 112

In the Office Action, claim 24, was rejected under 35 U.S.C. 112, second paragraph, in that the line 3 recitation of "said another spherical surface" lacks proper antecedent basis for this limitation in the claim. Applicant agrees with the Examiner and in the necessary correction, in amended claim 24, "spherical surface component" is replaced with --shaped surface portions-- in the manner originally set forth in its initial recitation in claim 19. This mischaracterization is regretted.

Claim Rejection – 35 USC § 102

Claims 1-5, 8, 9, 11-13, 19-22, 25 were rejected under 35 U.S.C. 102 (b) as being anticipated by Korzendorfer et al. (6,098,407). The Examiner's attempted detailed reading of the noted claims on the structure of Korzendorfer et al. will not be repeated here in the interest of brevity but Applicant would like to clarify what he believes to be the teachings of Korzendorfer et al.

Although contradicted by Col. 1, Para. 4, Korzendorfer et al. states, in col. 3, lines 13-16, "the main advantage ...is its capacity to accommodate dissimilar dimensional changes without sustaining any appreciable wear due to relative sliding..." (Emphasis added). Furthermore, in col. 5, lines 11-13, state "The positive connection 98 between the insert and shell forces the insert to be correspondingly displaced relative to the base 36." (Emphasis added) Finally, claim 1, in lines 59-62, recites "an insert...positively secured to the shell..." (Emphasis added)

In the Office Action, in Para. 7, line 26, the Examiner notes that "...portions are also axially movable relative to each other" (emphasis added). This is not factual inasmuch as the surfaces mentioned in Korzendorfer et al. are, in reality, positively secured and do NOT slide or move relative to one another. Continuing, with Para. 7, line 37 (page 5, line 9) the Examiner discusses alleged relative motion of shaped surface portion (near 98). Once again, there actually is a positive connection, namely a braze joint 98, between the insert and the shell. While there is axial movement, *due to thermal growth*, there is NO relative axial motion as alleged by the Examiner (ref. Office Action, Para. 7, line 45, or line 6 on page 7 thereof.).

Finally, in the various claims, while Korzendorfer et al. discusses a curved tube structure there is no recitation whatsoever regarding any mating parts with relative movement or that these include contoured surfaces. Thus, the Examiner is respectfully requested to withdraw his 35 U.S.C. 102(b) rejection of noted claims 1-5, 8, 9, 11-13, 19-22, 25.

Claim Rejection – 35 USC § 102(e)

In Para. 8 of the Office action, claims 1-5, 8-9, 11-14, 19-22, 25 were rejected under 35 U.S.C. 102(e) as being anticipated by Scalzo et al. (4,850,196). Again, the Examiner's attempted detailed reading of the noted claims on the structure of Scalzo et al. will not be repeated here in the interest of brevity, but Applicant would like to clarify what he believes to be the teaching of Scalzo et al.

In Para. 8, line 20, the Examiner notes that ..."the contoured surface portions are curved (cylindrical)". While it is correct that the Scalzo et al. device uses a sliding cylindrical interface, the tip retracts into the housing. However, while the Lehtinen (Applicant's) device uses a similar interface, it is used in a different manner. Specifically, the fuel tube 32 of the Scalzo et al. device does NOT experience any thermally induced mechanical loading. In the Lehtinen device of the present invention

the, the mechanical load is redirected by allowing relative movement of the tip to shroud interface. This relative movement redirects the stress into the transition region 46 of the fuel feed tube. The Scalzo et al. device represents a different configuration. Thus, the Examiner is respectfully requested to also withdraw his 35 U.S.C. 102(e) rejection of noted claims 1-5, 8-9 11-14, 19-22, 25.

Claim Rejections – 35 USC § 103

In a first rejection, the Examiner rejected claims 1-5, 8-9, 11-14, 19-22, 25 under 35 USC 103(a) as being unpatentable over Laing et al. (6,718,770) in view of Scalzo et al. (4,850,196) or Korzendorfer et al. (6,098,407). The Examiner's attempted and very detailed reading of the noted claims on the structure of Laing et al. will, again, not be repeated here in the interest of brevity. Applicant would, however, like to briefly clarify what he believes to be the factual teachings of Laing et al.

In the Office Action, in Para. 10, lines 12-14 the Examiner notes that "It is not clear whether the first and second complementary surfaces move relative to each other upon operation of said gas turbine engine...". Applicant is very familiar with this fuel injector laminated fuel strip in that his employer, the assignee of the present invention, actually manufactures this device. The mentioned surfaces do not move relative to one another. The Examiner, in the last three lines on page 9 of the Office Action, states "It would have been obvious ...to employ a movable joint at the claimed location, in order to better accommodate the thermal stresses within the fuel nozzle." Applicant is of the firm opinion that adding a movable joint in the claimed location on the Laing et al. invention would NOT work. The Examiner is respectfully requested to withdraw his 35 U.S.C. 103(a) rejection of claims 1-5, 8-9, 11-14, 19-22, 25.

In Para. 11 of this Office Action, the Examiner rejected claim 23 under 35 U.S.C. 103(a) as being unpatentable over the art, applied above, and further in view of already

previously cited Pidcock et al. (4,693,074). It appears to be the Examiner's position that it would have been obvious to one of ordinary skill in the art to employ a part spherical surface for one of the cylindrical surfaces as an equivalent structure for accommodating thermal expansion. Applicant agrees that the key spherical features of the Pidcock et al. device allow relative movement and limit loads. However, the spherical features of the present Lehtinen device do not limit loads but rather transfer and re-direct the loads, produced by the differential expansion of the hot components to adjoining cold components. Very importantly, the nozzle tip components move as one unit and there is only one degree of freedom, not six.

If the Pidcock et al. device were used on the internal components of Applicant's fuel nozzle, the fuel injection tip thereof would retract and shift within the outer structure of the fuel nozzle. This would lead to interference of the fuel spray via the previously-mentioned outer structure. In order to be workable, the tip must move as a single unit. The language common to Pidcock et al. and Applicant's claim 23 is "...spherical surface component". Spherical surface components, in and of themselves, are not novel and, in fact, have been used for a wide variety of applications, ranging from ball joint linkages to ballpoint pens. Pidcock et al. and Applicant's structure both use this common building block, however, as previously-noted, it is used in different ways. There is no teaching or suggestion in Pidcock et al. for using the noted spherical component structure in manner used in the present invention. Specifically, while all of the referenced prior art references describe fuel injectors that discuss the problem associated with fuel feeds, thermal gradients and potential thermal movement, none teach or suggest, either singly or in combination the addition of a pivoting movable joint to any of these structures, so as to allow the tip geometry to be controlled in order to reduce thermally induced stresses. Thus, why should it be obvious? Therefore, the Examiner is again respectfully requested to withdraw his 35 U.S.C 103(a) rejection of claim 23.

Applicant both acknowledges and appreciates the allowance of claims 15-18, 26, as well as the Examiner's objection to claims 6, 7 and 10 as being dependent upon a

rejected base claim, but that they would be allowable if rewritten in the manner suggested by the Examiner.

In order to overcome the Examiner's rightful 37 CFR 1.83(a) objection, relative to the drawings as they relate to features in claims 3, 5, 7, 21, new drawings 7A, 7B and 7C have been added on a drawing sheet labeled "New Sheet" in the top margin thereof. No new matter has been added since they are fully supported by the language of the noted claims as well as the description, starting on page 10, line 23 and continuing to page 11, line 2, of the present specification. In order to properly describe new drawings 7A, 7B and 7C, the necessary amendments have been made to both the "Brief Description of the Drawings and the "Detailed Description of the Invention." No new matter has been added.

As a result of the Examiner's 35 U.S.C. 112 rejection, claim 24 has been amended to correct the previously-discussed antecedent problem. Claim 25 has been similarly amended. No new matter has been introduced.

In light of the above reasoning, it is respectfully requested that claims 1-5, 8, 9, 11-13, 19-22, 25 are distinct from being anticipated either by Korzendorfer et al. (6,098,407) under 35U.S.C. 102(b) or that claims 1-5, 8-9, 11-14, 19-22, 25 are distinct from being anticipated by Scalzo et al. (4,850,196 under 35 U.S.C. 102(e) and are in condition for allowance. In addition, it is respectfully submitted that (1) claims 1-5, 8-9, 11-14, 19-22, 25 are not unpatentable, under 35 U.S.C. 103(a) over of Laing et al. (6,718,770) in view of either Scalzo et al. (4,850,196) or Korzendorfer et al. (6,098,407); or that (2) claim 23 is not unpatentable, under 35 U.S.C. 103(a) over any of the art, as previously applied, and further in view Pidcock et al. (4,693,074).

Thus, it is deemed that claims 1-14, 19-25 are in condition for allowance and prompt notice to that effect is respectfully requested.

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Nevertheless, should the Examiner continue to believe otherwise, the Examiner is kindly requested to contact the undersigned attorney by telephone, should the Examiner believe that it would result in a furtherance of this matter.

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Respectfully submitted,

A handwritten signature in black ink, appearing to read "CH Hunter", is written over a horizontal line.

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